THE AMERICAN
JOURNAL OF PHARMACY

MAY, 1912

A PROBLEM IN THE ASSAY OF FLUIDEXTRACT OF GELSEMIUM.

(Employing the LaWall Process.)

With Some General Remarks.

By L. E. Sayre.

Applying the LaWall alkaloidal assay process to the assay of Fluidextract of Gelsemium, the chief difficulty encountered in its successful application is found to be connected with the persistent presence of the fluorescent principle—the so-called Gelsemic Acid. The presence of very minute quantities of this seriously interferes with the sharpness of the change of color at the end point—point of neutrality—when the final solution of mixed alkaloids is titrated, using cochineal as indicator.

The LaWall Process,[1] briefly stated, is as follows:

> Dissolve 25 Gm. of Sodium Chloride in a graduated, 100 Cc. stoppered cylinder, in water enough to make 85 Cc. Add 10 Cc. of the fluidextract to be assayed and then make up the volume to 100 Cc. Agitate well for about one minute. Let stand for five minutes, agitate again and pour on a dry filter.
>
> Collect 50 Cc. of the filtrate representing 5 Cc. of the fluidextract and shake out with the proper amounts of the appropriate solvents, as directed for the final extraction of the alkaloid. Finally, titrate the solution of the mixed alkaloids, (in N/50 acid) with N/50 KOH. For computation of strength, the factor 0.1630 for 5 Cc. of Fluidextract is employed.

After several unsuccessful attempts to remove traces of this fluorescent principle (Gelsemic Acid) without, at the same time, removing the alkaloid, we have succeeded in accomplishing this by the following simple method. The final solution of the alkaloids

[1] See *Jour. Amer Pharm. Ass'n*, Jan., 1912, p. 29.

in chloroform is shaken with two portions (12 c.c. each) of distilled water. This water carries with it some alkaloid which is again washed out *at once* with chloroform. *At once* because, if the aqueous solution stands any length of time, the alkaloid seems to be lost by hydration (?). It takes but a few hours to lose entirely this minute quantity of alkaloid in aqueous solution. It is worthy of notice that some of the alkaloids of Gelsemium are appreciably soluble in water.

DIFFICULTIES IN APPLYING THE LAWALL PROCESS: For general assay purposes, that is, for the purpose of assaying various fluidextracts of Gelsemium of the market, we find considerable difficulty in applying the LaWall process. The fluidextracts of the market vary considerably in physical properties. This may be due to several causes; first, they are not all made by the official process evidently, but even if so made, they would vary from uncontrollable causes. For example, age of the preparation, age of the drug from which the preparation was made, the period of the year at which the drug was collected, and the locality from which the drug was gathered. Furthermore, we may say in passing that our examination of fluidextracts of Gelsemium, leads us to think that some of the manufacturers have attempted to secure uniformity of color by the addition of caramel, thus darkening a fluidextract of a light color. As a matter of fact, we have found some of the dark colored fluidextracts to be weaker in total alkaloids than the light.[2] If such a practice is indulged in, we certainly do not believe it a wise one.

Taking into consideration the variable physical quality of the fluidextracts of Gelsemium, we would naturally discard a method which would have a comparatively narrow range of application. This narrow range we find to be characteristic of the LaWall process when applied to Gelsemium preparations. A drug laboratory method should be one suited to the greatest variety of preparations found in the market—such as result from the above variable conditions.

The LaWall process applied to the fluidextract of Gelsemium which contains a very small percentage of coloring and inert matter works admirably, but we find that the time limit for the precipitation of the inert matter is entirely too short. The solution of the fluidextract in salt solution should remain about twelve hours and

[2] Many of the very light fluidextracts are evidently made from the fresh or green root.

then we find complete precipitation, but this precipitation carries down with it an appreciable amount of alkaloid. Therefore, for such fluidextracts as contain small amounts of coloring and inert matter, using the LaWall process, we would precipitate 10 c.c. of the fluidextract with about 75 c.c. (instead of 100 c.c.) of salt solution. After the precipitate has separated properly, it is filtered and the precipitate on the filter is washed with a sufficient quantity of 2 per cent. sulphuric acid to make 100 c.c. The combined filtrates are then neutralized, washed with immiscible solvents and finished as prescribed by the LaWall process to completion.

For those fluidextracts of Gelsemium on the market that are loaded with highly colored extractive matter, when these are treated by salt solution, there seems to be, in many cases, a colloidal precipitate which passes through the filter and the collectible precipitate clogs the filter. The LaWall process in these fluidextracts therefore fails. If, however, we substitute for a salt solution, acidulated water (2 per cent. sulphuric acid) we obtain a perfect precipitate inside of thirty minutes, when we then secure a very nice clear filtrate. If, therefore, we substitute the salt solution by acidulated water, we obtain a filtrate which, when followed by the other details of the LaWall process, gives us perfectly satisfactory and uniform results, bearing in mind, of course, the precaution which is emphasized in the beginning of this article, namely, to wash the chloroformic solution of alkaloids with two portions of 12 c.c. each of distilled water before titration.

IMPORTANCE OF STANDARDIZATION OF FLUIDEXTRACTS OF GELSEMIUM: It is the opinion of the writer that the Pharmacopœia should by all means, in its next issue, furnish not only a standard but a process for the assay of the Fluidextract of Gelsemium. Our experience in examining the fluidextracts on the market is that they are exceedingly variable in therapeutic quality; the alkaloidal variation being from about .02 per cent. to .5 per cent. of total alkaloids. It is the opinion also of the writer that a fair standard would be that the preparation should contain at least .225 per cent. of total alkaloid when assayed by the above process.

THE RELATIVE VALUE OF PHYSIOLOGICAL AND CHEMICAL ASSAY OF GELSEMIUM: We have performed in the Laboratory about one hundred different assays of Fluidextracts of Gelsemium and have also had an opportunity of observing the value of a physiological standardization. While we are not prepared to make any positive statements at present with regard to the relative value of a chemical

and a physiological assay, we feel safe in saying that a chemical assay alone for this drug is quite as valuable as a physiological assay alone; that a physiological assay and a chemical assay together gives one a better idea of the therapeutical value of the drug. But we are inclined to think that these two combined do not fully satisfy the practical requirements of the clinician who must get his standard from his own clinical practice. We would say further, that this remark applies to the standardization of almost any drug.

Mr. C. E. Vanderkleed [3] has stated that the manufacturer desires to put his products on the market of definite physiological strength—this is quite proper, but it must be borne in mind that there are so many factors to be taken into consideration that are not considered in a pharmacopœial or a physiological test, that these can scarcely be considered clinically satisfactory. However, a chemical test for the practical purpose of administering the Food and Drugs Law should reveal a percentage of total alkaloids in Gelsemium of at least .225 per cent. to be official.

A word must be said concerning the chemical test which confesses its weakness from a physiological point of view. The drug contains at least three different alkaloids. Until we can prove by pharmacological experiment which one of these alkaloids is the chief medicinal agent, the chemical assay, which reveals the total alkaloid, will give data, the value of which will be subject to criticism. One of the most prominent pharmaceutical manufacturers states the proposition thus:

"Until you elucidate the chemistry of Gelsemium we will not be able to adopt a more definite standard than the assay of combined alkaloids—we do not know what alkaloids are present nor in what relative proportions."

I am indebted to Mr. R. K. Dillingham, assistant, for valuable aid in making the above alkaloidal determinations.

COLOCYNTH U. S. P.*

By J. R. Rippetoe, P.D., and R. Minor, Phar.D.

The U. S. P. 8th revision defines Colocynth as the "peeled dried fruit of *Citrullus Colocynthis*" and states that "the seeds should be separated and rejected." The fruit is usually peeled after drying,

[3] Am. Jour. Phar., Oct., 1910, p. 454.

* Read at the December meeting of the American Chemical Society, 1911.

and the seeds, which are embedded in the pulp, are necessarily separated by mechanical means which may not assure complete separation.

Power and Moore[1] found 75.5 per cent. of seeds in Turkey Colocynth. A sample of apples examined in this laboratory was found to contain 74.8 per cent. of seeds. The question arises, "Is it practical to separate all the seeds?" If not, what should constitute a fair allowance of seed in the pulp, and what should be the U. S. P. requirements for the drug?

Pearson,[2] examining two lots of pulp which consisted of pieces and fine powder, found about 2 per cent. of seeds in the pulp, and by comparing the microscopical appearance of the fine powder with that of a sample containing a known proportion of seeds, considered that about 3 per cent. of seeds were present in the powdered material.

We recently examined seven samples of pulp representing 1100 pounds imported from the London market, with the results as shown in table 1.

TABLE 1.

Sample No.	Pulp Per cent.	Seed Per cent.	Peel Per cent.
9548	96.93	1.27	1.80
9674	98.41	1.17	.42
9675	99.05	.79	.16
9676	99.03	.87	.10
9677	99.06	.78	.16
9678	98.94	.48	.58
9679	99.61	.14	.25

The pulp contained very little fine powder and was not examined for seed that could not be detected by the eye. Over three-quarters of the seed by count were undeveloped, and were much lighter and more inclined to adhere to the pulp than the fully developed seeds. It will also be noticed that practically as much peel as seed was also found present.

Making a quantitative examination of the pulp, when in pieces, for seed is a simple operation but if the pulp is in the powdered state, the detection and determination becomes more difficult.

Mansfield[3] describes and illustrates the microscopical appear-

[1] *Pub. of the Wellcome Chemical Research Laboratories,* London, Jan. 20, 1910.

[2] *A. Ph. A. Bulletin,* Aug., 1911, 344.

[3] *Drug Circular,* Feb., 1910, 56.

ance of the powdered pulp, powdered rind and powdered seed, aiming to show how readily the seed and the rind tissue may be detected when present. We find in the seed aluerone grains and stone cells, but in the pulp, free from seeds, none, and by careful and patient comparison with a known sample of mixed powdered pulp and seed, an approximate determination may be made.

Power and Moore found the seed of Turkey Colocynth when extracted with light petroleum to yield 12.72 per cent. of their weight of fatty oil and by extracting with carbon tetrachloride Grimaldi and Prussia[4] obtained about 17 per cent. of fixed oil from the seed.

Hooper[5] obtained from Baluchistan colocynth seed 17.8 per cent. of a yellow drying oil.

Evans' Sons, Lescher and Webb[6] examined two samples of pulp, free from seeds and obtained 0.2 and 0.4 per cent. respectively of petroleum ether extract, and from four samples of powder 0.7, 1.4, 0.3 and 9 per cent.

The British Pharmacopœia, revision of 1898, requires that "only traces of fixed oil should be removed from the pulp by ether. The pulp after drying at 212° F. should yield at least 9 per cent. of ash indicating the absence of seeds." Dowzard,[7] however, found that Pure Colocynth Pulp yields about 3 per cent. of soluble matter when extracted with ether. He obtained by means of petroleum ether only 1.16 per cent. of extract and from the pulp, so extracted, 2.75 per cent. of soluble matter was subsequently extracted by ether. Six other samples of Colocynth pulp yielded direct to petroleum ether: 0.52, 0.58, 0.6, 0.98, 1.20, 1.33 per cent. of extract.

Havenhill[8] suggests that for Colocynth a limit of petroleum ether extract is desired.

Barclay[9] considers the estimation of ash in powdered pulp to be useful in ascertaining its freedom from seeds. He found the average ash of 8 samples as follows: Pulp 11.45 per cent., seeds 2.37 per cent. and the whole apple 4.6 per cent. Greenish[10] examined 7 samples of Colocynth apple and found in the pulp, free from seeds, from 8.62 to 13.43 per cent. ash, while the whole apple yielded from 4.43 to 5.86 per cent. Roder[11] found a sample of Colocynth (presumably the pulp) with 13.66 per cent. of ash.

---

[4] *Boll. Chim. Farm.*, 1909, No. 3.
[5] *Pharm. Journ.*, Aug. 8, 1908, 161.
[6] *Analytical Notes*, 1906–07, p. 15.
[7] *Pharm. Journ.*, Sept. 12, 1903.
[8] *A. Ph. A. Proc.*, 1908, 932.
[9] *Amer. Drug.*, March 10, 1896, 152.
[10] *Pharm. Journ.*, March 30, 1901, 398.
[11] *Jahresbericht, Wien.*, 1908, 81.

A sample of Colocynth apples which contained 74.8 per cent. seed was examined in this laboratory for petroleum ether extract, dilute alcohol extract and ash in the whole apples, the pulp free from seeds, the seeds and a mixture of the pulp and seed. The petroleum ether extract was determined by macerating 2 gms. of the fine powder with about 20 c.c. of petroleum ether for 2 hours with continuous shaking. The mixture was then transferred to a filter and washed, the filtrate evaporated and dried at 100° C. to constant weight. The dilute alcohol extract was determined by macerating 5 gms. of the drug 48 hours and percolating until exhausted. A quantity of the percolate representing 1 gramme of the drug was evaporated and dried at 100° C. to constant weight. The ash was determined using a platinum crucible, at a temperature not above red heat. The results are recorded in table 2.

TABLE 2.

	Pulp Per cent.	Seed Per cent.	Pet. Ether Ext. Per cent.	Ash Per cent.	Dil. Alc. Ext. Per cent.
Whole apples.....	25.2	74.8	12.58	3.73	14.22
Pulp	100.0	....	0.44	9.20	43.20
Seed	....	100.0	15.56	1.96	5.20
Pulp and seed	97.0	3.0	1.22	9.02	40.14

The ash is practically all soluble in dilute hydrochloric acid, and contains potassium, sodium, chlorine and carbonates. No other elements were tested for. Hence the necessity of avoiding a high temperature on incinerating since the potassium and sodium chlorides may be volatilized. The rind contains about the same amount of ash as the pulp.

Three of the samples of pulp previously referred to in table 1 and three samples of powdered Colocynth were examined in the same manner, the results being recorded in table 3.

TABLE 3.

Sample	Pet. Ether Ext. Per cent.	Ash Per cent.	Dil. Alc. Ext. Per cent.
Pulp No. 9548 with seed and rind.....	0.77	13.03	42.55
Pulp No. 9548 without seed and rind....	0.65	13.03	43.46
Pulp No. 9674 without seed and rind....	1.05	12.68	40.00
Fulp No. 9675 without seed and rind....	0.64	12.10	42.75
Powder No. 9395.....	4.40	6.12	29.49
Powder No. 9510.....	1.21	9.87	31.90
Powder No. 9511.....	0.74	12.68	39.51

The sample of powder, No. 9395, examined microscopically, contained aleurone grains and stone cells from the seed and stone cells characteristic elements of the peel. The high petroleum ether extract and low ash obtained indicate without a doubt that the powder contained an excessive amount of seed. The dilute alcohol extract was also low but then sample No. 9510 contained only 31.90 per cent., while the amount of petroleum ether extract and ash indicate that it did not contain more than 2 or 3 per cent. of seed. The number of aleurone grains found, indicated even less when compared with the sample of pulp No. 9548 with seed and rind, and pulp containing 3 per cent. of seed. Sample of powder No. 9511 contained practically no aleurone grains but contained the characteristic stone cells of the rind.

Conclusions.

Commercially the pulp cannot be entirely freed from seeds, but it can be obtained containing less than 2 per cent. of seeds. The pulp may also contain pieces of the rind.

The presence of seed and rind in the powdered pulp can be readily detected (with the microscope) by the presence of aleurone grains and their respective characteristic stone cells.

The seeds contain a large amount of fixed oil which is extracted by petroleum ether while the pulp free from seed yields usually less than 1.0 per cent. petroleum ether extract.

The seeds contain not more than 2.0 to 2.5 per cent. of ash while the pulp contains from 9.00 to almost 14.00 per cent. which is soluble in dilute hydrochloric acid.

In view of the above conclusions, we suggest that the ninth revision of the U. S. Pharmacopœia require that Colocynth should not yield more than 1.5 per cent. of petroleum ether extract and contain not less than 9 per cent. of ash soluble in dilute hydrochloric acid. These requirements would apply more to the powder than to the pulp in pieces. We would also suggest that Colocynth be defined as "the pulp of the peeled dried fruit."

Analytical Department, Schieffelin & Co., New York.
December 5, 1911.

DIGITALIS

Its Cultivation, Collection and Preparation.

By Edwin L. Newcomb, P.D.

Department of Pharmacognosy, College of Pharmacy, University of Minnesota.

The production of the drug digitalis from cultivated plants is a subject which merits the attention of workers in the different sections of the country. The need for such work is indicated by the following references which it seems well to quote at this time: Tschirch,[1] in a number of papers, has discussed the cultivation of medicinal plants and the effects of various soils and other factors upon the therapeutic quality of the drugs produced. He quickly eliminates the theory that drugs from wild plants are better than those from cultivated plants by the statement that the theory rests in a lack of knowledge of methods of cultivation that produce the largest amount of product value.

The researches of Chevalier[2] indicating that nitrogenous fertilizers increase the alkaloidal value of belladonna and that potassium and phosphates are without effect on the plant in this respect are of importance and indicate that uniformity in drugs from cultivated plants can probably come only after a thorough understanding of the effects of various fertilizers upon drug plants.

A most valuable communication on "The Variations in the Activity of Certain Toxic Drugs with Suggestions for an International Inquiry" was presented by McEwan and Forrester[3] to the Section on Pharmaceutical Chemistry of the Seventh International Congress of Applied Chemistry, which met in London in 1909. The authors suggested along with other lines of work:

1. Studying and recording data concerning climate, soil and other factors characterizing the localities where the drugs are grown and harvested for commercial purposes.

2. Periodical chemical analyses of the parts of the plants used medicinally to ascertain whether the parts are harvested at the proper times. After a large amount of international correspondence the authors conclude that different climatic conditions are responsible for variations in the constituents of plants of the same species in their respective habitats and that the constituents

vary according to the stage of growth the plants have reached. They also give particulars regarding the cultivation and collection of aconite leaves and root, belladonna leaves and root, digitalis leaves and henbane.

This brings us to the consideration of the cultivation of medicinal plants with a conception of what the work really means, quite different from that held by the apothecaries of early times. The work is far from simple plant culture as many are inclined to regard it and involves investigations that will require years before we will be able to solve the mysteries of the chemical laboratory of the plant. One does not have to work long with plants before he realizes the truth of what Prof. H. Thoms [4] has recently said: "The plant is a better chemist than we are, has better laboratories than we have. We must study conditions of growth, we should appoint a committee to inquire, to find out how to compel the plant to produce a definite amount of alkaloid."

The soil and climatic conditions in which medicinal plants grow natively are important considerations and only after a careful study of these and other conditions have some of our medicinal plants been successfully cultivated. Chevalier [5] states that "Where a reduction of activity occurs it is solely due to the fact that cultivation is largely carried on without regard to the natural conditions and soil." We have every reason to believe that future research will disclose methods of culture, etc., which will yield drugs of far greater value and uniformity than are now obtainable.

Our work in the cultivation of medicinal plants at the College of Pharmacy of the University of Minnesota has been directed first to develop conditions for the various plants approaching those under which they naturally grow and then to study the effects of variations, selections, breeding, etc., with the end in view of increasing the educational facilities of the College.

Although *Digitalis purpurea* is probably indigenous to central and southern Europe, it is said to be naturalized now in California, Oregon, Washington and West Virginia. The soil in which digitalis seems to thrive best has been very well described by Holm [6] who says: "Foxglove grows best in well drained, loose soil, rich in leaf mold, but it does not grow in calcareous soil. It will grow either in shade or sun, but prefers a moderate amount of sun. Although naturally a biennial, after flowering young shoots will develop between the radical leaves and form three or four large

flowering stems during the third year. In suitable soil it readily renews itself by seed."

The plots devoted to digitalis culture received a fair amount of sunlight. The soil consisted of a loose sandy loam mixed with several inches of peat which had been upon the ground for a number of years. The sub-soil was sandy and so porous that water would remain upon the surface for only a short time after heavy rains. From recent examinations of peat by Schoor,[7] Hoff,[8] and others, it seems that this substance, although differing somewhat chemically from leaf mold, may largely supply what plants naturally acquire from the latter. The growth of the plants indicated that the soil conditions were very suitable. A large number of young seedlings came up in close proximity to a number of seeding plants.

The following local climatological data are recorded because of the probable effect of climatic conditions upon the constituents of plants. With such data and some knowledge of the character of the soil one can judge in a general way which plants would be likely to grow successfully in a given locality, although it must be borne in mind that practically all plants possess some power of adaptation and that the most luxuriant plants may not always produce the most valuable drug.

CLIMATOLOGICAL DATA COVERING THE GROWING SEASON, MINNEAPOLIS, MINN., 1911, LATITUDE 44° 59′ NORTH, LONGITUDE 93° 18′ WEST.

Months	Temperature			Precipitation	
	Maximum	Minimum	Mean	Precipitation	Dep. from Normal
April.....	79	15	45.8	2.55	0.11
May.....	92	30	63.6	4.10	*0.18
June.....	98	50	73.1	6.93	*2.92
July.....	99	50	71.1	4.62	*0.81
August.....	89	45	66.6	3.65	−0.04
September .	88	41	59.2	5.83	*2.17
October	72	23	45.8	6.42	*3.84

* Equals excess above normal precipitation.

The mean temperature for May and June was 5.8 degrees in excess of the normal temperature for these months. During the other months of the growing period the temperature was slightly below normal. A total of 34.1 inches of rain fell during the grow-

ing period which was 10.03 inches above the normal precipitation. During the months of September and October, when the leaves of digitalis were collected, the precipitation was much above normal as is indicated by the accompanying table. The last killing frost in the spring occurred on May 2d and the first in the fall on October 22d. During the year there were 153 cloudy days, 92 partly cloudy and 120 with sunshine. Water was supplied by means of a hose and sprinkler when required.

The germination and planting of Digitalis have been considered in an earlier paper.[9] The early part of the past summer was exceedingly hot. In order to keep the plants from wilting badly it was necessary to water them abundantly each day. With this treatment they grew quite well. A wet season began the latter part of August and from this time on until frost the plants made a remarkable growth.

The plants do best if transferred from the cold frames to the open during a wet cloudy spell. They should be well watered when transplanted during a hot and dry time. With proper care the plants are very hardy after they once become rooted. Experience in the growing of Digitalis for a number of seasons in New Jersey and more recent observations in Minneapolis indicate that the plant will stand any ordinary amount of dry weather without serious injury, although during such periods the amount of foliage produced is much less than under more favorable conditions.

The young leaves of the first year's growth arise directly from the crown of the plant and hence are situated close to the ground. They are exceedingly tender when they first appear and easily injured or retarded in their development by having soil thrown over them or by being covered with water for some time. For this reason the level of the plots containing the plants should be a few inches above that of the surrounding paths. In case the plants are to be cared for by means of a horse and cultivator, they should be planted on ridges a few inches high and an equal distance apart each way (about nine decimeters) so that cultivation may be carried on in each direction. No fertilizer whatever was applied to any of the plots. Chemical examinations are being made of the soil in the various plots and these with a study of the characteristics of the ash of the drug produced will be considered in a subsequent paper. It may be stated at this time, however, in view

of the recent work by Burmann [10] that the ash contains manganese. This was also true of a sample of digitalis leaves collected from plants growing wild in the State of Washington. Examinations of three different samples of imported digitalis leaves gave positive reactions for manganese.

The plants growing outside appear to be quite free from the attack of aphis, black beetles or other insects injurious to the foliage of many plants and with the exception of four or five which turned yellow and appeared affected by some pathological condition, they presented a very healthful appearance, many of them measuring two feet across. The size of the plant of course is largely determined by the conditions under which it grows. It is interesting to note that Jenner [11] observed a digitalis plant growing upon stable manure in Canada which was upwards of eight feet high and had leaves fully a foot in length. A plant I had under observation in New Jersey a few years ago produced four flowering stalks during the third year's growth, the tallest of which was six feet high.

Attention has been called to the fact that plants during their second year's growth frequently send up shoots from between the basal leaves and that these secondary shoots produce flower stalks during the third year. These lateral developments are in the nature of new plants which resemble first year plants grown from seed. Under favorable conditions these secondary shoots are frequently produced during the first year's growth, this being especially true if the seeds are sown early in a greenhouse. Observations during the past year upon a plot of two-year-old plants indicate that it is difficult to tell which leaves are from the old crown and which from the new shoots, except when the flower stalk is present. It is also to be noted that the plants may not blossom at all during the second year, probably because of unfavorable growth conditions. A well drained sandy plot free from peat was planted early in the spring with one-year-old plants. Although well watered during the early dry spell the plants made a poor growth; a few produced weak flowering shoots; a number died and the twenty odd remaining plants which held their own were transplanted at the end of eight weeks into a peat loam plot. They immediately began a more vigorous growth and about half of the remaining plants flowered before frost. All of these plants produced numerous secondary shoots. Another plot with sand-

gravel soil free from peat was filled early in the spring with nine-months'-old vigorous plants. These made a good growth and had a healthy appearance, but produced no flowers or lateral shoots.

From these observations it would seem that collectors very likely secure some leaves that are not developed from the second year crown and that much of the drug on the market probably consists of a mixture of the leaves from the first year lateral shoots and the old second year crowns.

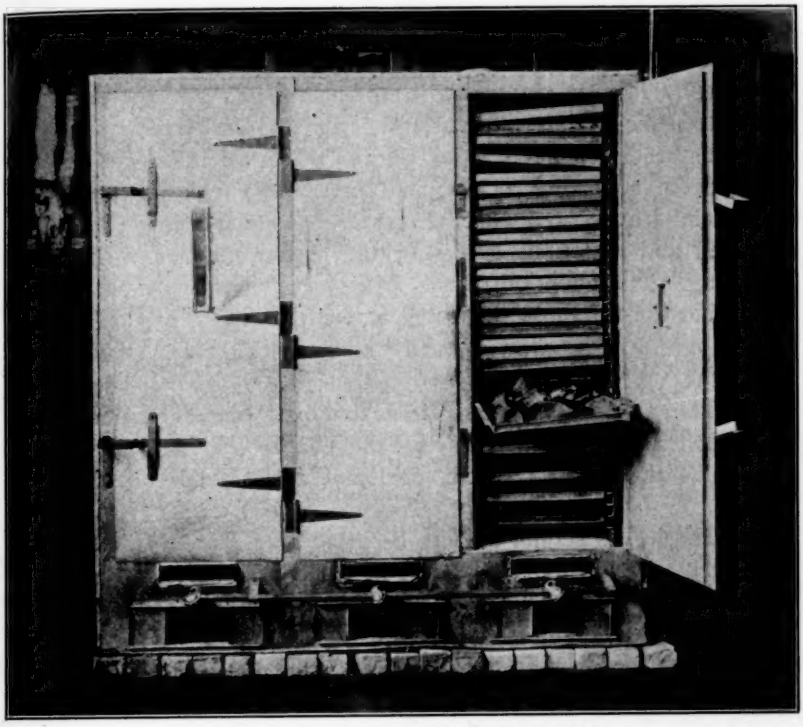
A review of different pharmacopœial definitions for Digitalis reveals the fact that for many years most pharmacopœias have directed that the leaves should be collected at the time the plant flowers, although it is doubtful if this requirement has ever been based upon the results of comparative valuations of the medicinal quality of leaves of the first and of the second year's growth. The pharmacopœias of ten different countries require Digitalis leaves to be collected from plants of the second year's growth and five require the leaves of wild-growing plants. Ten pharmacopœias define the time of collection—seven stating "at the commencement of flowering," and three, "when in flower." Eleven require the drug to be renewed yearly and three give a test to demonstrate the presence of the active principles.

Farr [12] considers the leaves of the second year as rather more potent, although the first year leaves contain a larger percentage of petioles which may account for the slight difference. Hart [13] reported an interesting series of experiments which indicate that the first year's leaves are more valuable than those of the second year and that careful drying is essential. Hale [14] reported on the examination of first year leaves grown at Madison, Wis., Arlington, Va., and Seattle, Wash., all of which were more active than selected English leaves of the second year's growth. Many others have expressed the opinion that first year leaves are probably just as valuable as those gathered during the second year's growth. Cæsar and Loretz [15] have pointed out that leaves collected during a wet season are less toxic than those gathered from the same locality during a succeeding warm and dry spell. The same workers considered the effects of drying Digitalis in different ways and conclude that preliminary sterilization by steam is detrimental to the activity of the drug and that leaves quickly air-dried show the greatest physiological value. They conclude also that it is immaterial whether the leaves are collected from first year or flowering

plants, but that the time of collection is important. The leaves from plants of the second year's growth are usually collected in July, while the first year's leaves attain their full physiological action after August. The latter, they state, not only equal but often surpass in activity the leaves of two-year plants.

The importance of the proper drying and preservation of

FIG. 1.



One of the large ovens for quickly drying digitalis leaves.

digitalis leaves has been pointed out by a number of workers, although the temperature at which the leaves should be dried and the method of carrying on the work has not received the attention that it seemingly deserves. Wang,[16] Cæsar and Loretz,[17] Wippern,[18] Focke[19] and others believe that there is a distinct deterioration in the medicinal value of the drug unless carefully preserved. The general consensus of opinion at the present time seems to be that there is very little change even after the elapse of several years

in the activity of the drug if it is quickly dried to a moisture content of about three per cent. or less and kept in air-tight containers with a small amount of unslacked lime. The hygroscopic character of the leaves demands artificial heat with but probably few exceptions during the drying process in order to properly prepare the drug. To determine the effects of various temperatures upon the physiological activity of the drug during the drying process, Hale [20] carried out a number of experiments and recorded results showing that the action of the drug is not lessened materially unless the temperature exceeds 120° C.

Results like the foregoing lead one who is familiar with the drug to believe that the variations in the medicinal quality of Digitalis are more likely to be due to a lack of uniformity in the methods of collecting, drying and preserving than to the use of first year leaves, and that pharmacopœial definitions should be changed and directions given for the proper manner of handling the drug. The adoption of the following general rules which are a modification of those presented a few years ago by K. Alpers [21] should go a long way towards securing Digitalis of uniform strength:

1. The stock of digitalis leaves should be procured shortly after the leaves are gathered by reliable parties who make a specialty of this work; or, if possible, the leaves should be collected personally.

2. The leaves should at once be dried as completely as possible in a well ventilated drying-closet at a temperature not exceeding 100° C. and then at once enclosed in air-tight receptacles containing small amounts of freshly burnt lime.

3. Finely powdered Digitalis should be kept in small quantities only so that it may be consumed in a short time. This powder may be kept in glass containers carefully stoppered, and containing freshly burnt lime properly held.

Before considering the various experiments carried out in the drying of the leaves grown during the past summer, it may be of interest to give a few notes upon the collection. This work began September 1, 1911, and was carried on almost entirely by students, who found the work not only interesting but primarily instructive. The leaves collected were all from plants of the first year's growth with the exception of a few from a small plot containing two-year-old plants. A rather long-bladed sharp knife

proved to be the most suitable instrument for cutting the leaves from the plant, the collector grasping a handful of the thick foliage with the left hand and with one stroke of the knife severing from six to twelve leaves. Care was exercised to cut those leaves which had apparently reached the most active photosynthetic stage. The older slightly yellow leaves were collected separately or rejected and the young leaves were left to grow. The collection from flowering plants is somewhat more tedious as has been pointed out by True [22] due to the fact that some of the leaves are scattered along the flowering stalk and have to be gathered one at a time. One noticeable thing in connection with the collection of the leaves was that the hands of the collector became sticky, probably from the exuding contents of the glandular hairs as the cut surfaces of the petioles seldom came in contact with the operator. Investigations are in progress to determine the character of this exudate. The average weight of select fresh leaves taken from each of the one-year-old plants was four hundred grammes. In addition to the select leaves an average of one hundred grammes of yellow or slightly yellow leaves were taken from each plant, some of which were reserved for assay. Only about one-third of the total crop of leaves suitable for drug purposes was collected.

The plants continued to grow rapidly after the first leaves were cut and within four weeks time there were a large number of mature leaves developed. Only a few of these were cut for fear that the plants would be more likely to winter-kill if they were deprived of their foliage at this time. Two crops could probably be gathered if the first were gathered in August. The importance of the time of collection, however, must not be overlooked and further investigations are necessary before it can be stated that the leaves which develop during the cooler weather are similar or equal in medicinal value to those which grow in the warmer months. In view of recent results showing that leaves collected during a wet period are less active than those collected during a dry spell, it should be noted that the months of September and October were characterized by very frequent rains.

The plants were under close observation during the growing and collecting season and the following notes may be of interest: The leaves of *Digitalis purpurea alba* appeared to be uniformly lighter in color than those of the other varieties, while the leaves of *Digitalis purpurea monstrosa* are uniformly somewhat more nar-

row. It was also noticed that certain plants in each of the different plots produced foliage quite different from that of the surrounding plants. Some of the plants were characterized by having leaves with purplish spotted petioles while others did not show these at all. This marking seemed to predominate in the darker flowering varieties. Several hundred transverse and surface sections of leaves of each of the different varieties of *Digitalis purpurea* including *monstrosa* were made and examined. Although the growing plants of the several forms presented a somewhat different appearance the leaves resembled each other very closely histologically. It was noted as has been pointed out by Kraemer [23] that the leaves of certain plants possessed many more glandular hairs than those of other plants. This difference did not seem to be characteristic of any one variety. An attempt is being made to follow up these plants in which glandular hairs predominate and determine whether the leaves collected therefrom are more valuable medicinally. A number of abnormal forms of leaves were found among the plants. These had two distinct mid-ribs and a more or less bifurcate lamina. One plant produced two of these abnormal leaves, each having equally divided lamina and a conical hollow petiole. Only eight or ten such monstrosities were found among about twelve hundred plants under observation. It is probably rather early to predict the bearing of such characteristics upon the value of drugs produced from these plants, but it is not unlikely that future work in plant breeding and other selective processes will develop pharmacognostical strains differing widely from each other therapeutically, but which botanically may be identical. Tschirch [24] in considering physiological varieties in a recent paper refers to the subject as follows: "The plant producing Siam benzoin, which contains benzoic acid alone, cannot be distinguished by any botanical characteristics from the plant which produces Sumatra benzoin, which contains cinnamic acid with benzoic acid. ——— Indian cannabis can only be distinguished from European cannabis by its greater production of resin and the bitter almond from sweet almond only by the presence of amygdalin. These differences are physiological and chemical."

The fresh digitalis leaves were taken directly into the laboratory after each collection. A portion of each sample was used for the preparation of a fresh tincture according to the U. S. P. formula for tincture of fresh herb and the remaining quantity was dried by one or more of the following methods:

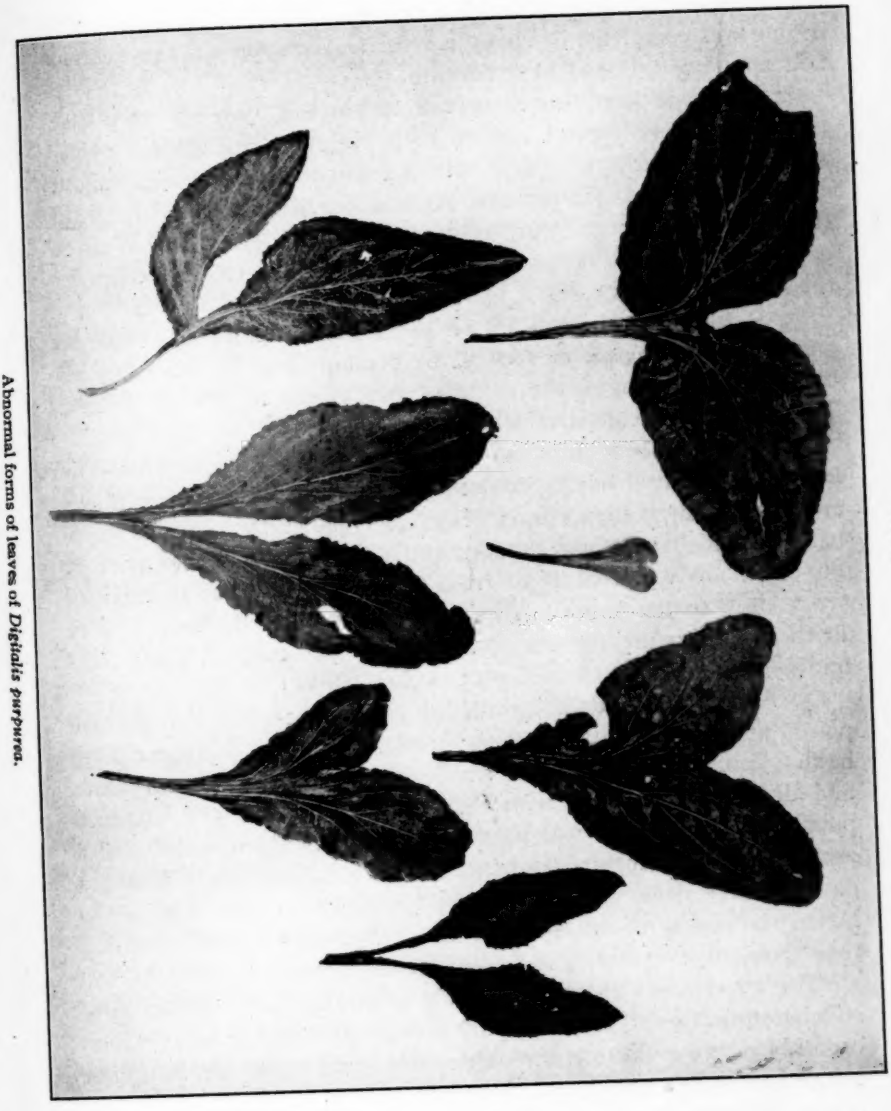


Fig. 2.

Abnormal forms of leaves of *Digitalis purpurea*.

1. Air dried—The leaves were spread out about one layer deep upon the laboratory tables. At the end of nineteen days they were still so moist that they could be rolled up without crumbling. The drying was completed by spreading the leaves upon window screens and applying artificial heat beneath.

2. Artificial heat, leaves spread out in the open—In this case the leaves were spread six or eight layers deep upon window screens, sand-baths provided with gas burners were placed about eight inches below the screens. It was found necessary to spread the leaves much more in order to complete the drying within three days as desired. A uniform temperature was difficult to secure by this method of drying.

3. Artificial heat, small hot air ovens—An attempt was made to quickly dry the leaves at 100° C. by placing them in small hot air ovens. This changed the color of the leaves to a dark brown. The drying was comparatively slow.

4. Artificial heat in fume closet with hot air current—The leaves were placed one layer deep upon screens stacked one above another in a large fume closet. Heat was applied by means of sand-baths provided with gas burners and placed in the lower part of the closet. A temperature of from 75° to 100° C. was maintained from eight to ten hours a day. By this method the leaves were dried to a moisture content of about four per cent. in three days and without losing their rich green color.

5. Artificial heat, double walled drying ovens—The leaves were placed one layer deep upon the 17 x 28 inch trays, the larger oven holding ninety trays and the smaller one sixty. The ventilators and drafts were opened wide. A charge of about one hundred pounds of fresh leaves was placed in the ovens at one time, and a nearly uniform temperature of 100° C. mantained eight hours a day for three days. In this manner about fifteen pounds of dried leaves containing about four per cent. of moisture and retaining their green color were produced from each charge.

The last two of the five methods of drying seem particularly suitable in that the leaves are quickly dried at a temperature which probably destroys the ferments, fixes the green color and does not injure the active principles. The use of the large drying ovens is to be preferred as the temperature can be more accurately controlled, thus lessening the possibility of breaking up the constituents by excessive heat. It was noted that the very yellow leaves dried

more quickly than those which were slightly yellow and the latter more rapidly than the select green ones; young immature leaves required a still longer time to dry.

Moisture determinations were made on a large number of samples. These showed that an average of eighty-five per cent. of moisture was lost upon drying. The results of certain investigators indicate that the petioles and mid-ribs contain less of the active principle than the lamina. These parts may be largely removed from the dry drug by sifting the more or less broken leaves through sieves having about five meshes to the linear inch. The laminated petioles were separated from one lot of fresh leaves and the petioles lost ninety per cent. of moisture on drying, while the lamina lost eighty-six per cent.; the separated petioles represented thirty-three per cent. of the total weight of the dried drug. One lot was partially dried and then the petioles and mid-ribs were stripped from the lamina; the lamina represented about fifty per cent. of the weight of the dried drug.

The drug prepared during the past year was transferred directly from the driers to tin cans holding about one pound each. A one-ounce wide-mouth bottle filled with freshly burnt lime and covered with gauze was placed in each can. The different species and varieties of digitalis, which have been grown, and the leaves collected and prepared by the various processes described include the following: No. 46 *Digitalis lutea,* No. 48 *Digitalis purpurea maculata superba,* No. 50 *Digitalis lanata,* No. 51 *Digitalis grandiflora,* No. 53 *Digitalis purpurea* mixed, No. 54 *Digitalis ferruginea gigantia,* No. 56 *Digitalis purpurea monstrosa* mixed, No. 57 *Digitalis purpurea alba,* No. 60 *Digitalis purpurea* mixed and No. 49 *Digitalis purpurea rosea.* It is probable that much of the drug sold as Digitalis at the present time consists of the leaves of the different varieties of *Digitalis purpurea.*

The medicinal value of the drug prepared is being carefully studied by chemical and physiological assays and will be reported upon in a later paper. It may be stated at this time, however, that the tests thus far completed indicate that the quality of the carefully prepared drug is probably equal to that of the best drug on the market. Unfortunately a method for the assay of Digitalis has not as yet been introduced into the U. S. P. Pharmacists can do a great deal, however, to insure themselves of having digitalis preparations of uniform quality by paying particular attention to the manner

in which the drug is dried and the conditions under which it is preserved. Practically all investigators agree that the drug should be quickly dried and preserved in air-tight containers with a small amount of freshly burnt lime or other suitable material. By taking this precaution a vast amount of good will be accomplished.

REFERENCES.

[1] Tschirch: *Pharmaceutical Era,* vol. xlii, p. 649; vol. xliv, p. 478.
[2] Chevalier: Jahresb. d. Pharm., Götting., vol. 45, p. 75.
[3] McEwen & Forrester: *Chemist and Druggist,* vol. 74, p. 877.
[4] Thoms: *Chemist and Druggist,* vol. 74, p. 879.
[5] Chevalier: *Pharm. Ztg.,* iv, 1910, No. 39, p. 397.
[6] Holm: *Pharm. Journal.,* 1905, p. 5.
[7] Schoor: *Journ. Am. Peat Soc.,* vol. 3, 1911, 226–32.
[8] Hoff: *Journ. Am. Peat Soc.,* vol. 3, 1911, 192–201.
[9] Newcomb: Am. Journ. Pharm., vol. 83, p. 526–33.
[10] Burmann: *Schweiz. Wochschr.,* 1911, p. 562.
[11] Jenner: *Canad. Druggist,* 1905, vol. 17, p. 406.
[12] Farr: *Pharm. Journ.,* 1907, p. 198.
[13] Hart: *Pharm. Journ.,* 1908, p. 440.
[14] Hale: Bull. No. 74, Hyg. Lab. U. S. Pub. Health and Marine Hosp. Serv., Wash., p. 27–28.
[15] Cæsar & Loretz: Halle, Geschaftsbericht, 1910, p. 23.
[16] Wang: *Apoth. Ztg., Berlin,* 1906, vol. 21, p. 890.
[17] Cæsar & Loretz: Geschafts., Berlin, 1906, p. 29–31.
[18] Wippern: *Apoth. Ztg.,* Berlin, 1906, vol. 51, p. 807.
[19] Focke: *Apoth. Ztg.,* Berlin, 1906, vol. 21, p. 580.
[20] Hale: Bull. No. 74, Hyg. Lab. U. S. Pub. Health and Marine Hosp. Serv., Wash., p. 30–31.
[21] Alpers: Pharm. Ztg., vol. 67, p. 703–05.
[22] True: *Oil, Paint and Drug Rep.,* 1906, vol. 70, Oct. 17, p. 37.
[23] Kraemer: Amer. Journ. Pharm., vol. 83, p. 365.
[24] Tschirch: *Pharmaceutical Era,* vol. 44, p. 479.

SOME POINTS IN RELATION TO MEDICAL AND PHARMACAL LEGISLATION.

By F. E. Stewart, Ph.G., M.D.

I was invited to take part in a discussion of a paper by Dr. Henry Beates, Jr., so well-known in connection with his presidency of the Medical Examining Board of the State of Pennsylvania, upon the subject "A Consideration of Some of the Causes that are Determining the Decline of Medical Practice and Causing

the Public to Lose Confidence in the Physician." This discussion occurred at the meeting of the Northern Medical Association of Philadelphia, Friday evening, February 9, 1912, at the hall of the Northern Dispensary.

In the afternoon of the same day, Mr. John C. Wallace, ex-president of the Pennsylvania Pharmaceutical Association, read a most interesting paper before the Philadelphia College of Pharmacy on "Pharmaceutical Legislation." This paper contained an excellent review of the various laws now before Congress of the United States and the various States of the Union. As his paper was right in line with the discussion in which I expected to take part in the evening, I read my remarks before the College.

Now, as these various subjects which seem to be so diverse are really parts of a whole and relate to the very question under discussion by Dr. Beates, I wish to call attention to the principles underlying this class of legislation for the purpose of showing some of the reasons why the medical and pharmaceutical professions are losing prestige in the eyes of the community.

First, let us recall the history of the medical and pharmaceutical professions as to their origin, functions and also to the belief of the people relative to the ability of the physician to cure the sick and their faith in the power of the substances used for that purpose, known as drugs.

The medical profession had its origin during the tribal stage of civilization. The medicine man was a religious dignitary, his influence over the tribe being that of fear, rather than of awe and spiritual dignity. The Indian medicine man dispensed his own medicines, carrying them around in a "medicine-bag," consisting of a pouch containing charms and other apparatus of his magical arts. In the Mosaic economy, the priest was lawgiver and physician. Kitto says that nothing is more certain than the essential identity among all ancient nations of the professions—religion, law and medicine, which the progress of civilization has separated into three.

Turning to the history of European civilization, we find that in ancient times service in the church was the only profession recognized by State and people. Tracing the history of medicine in England, we find that medicine and law were practiced by the priests. After a time, surgery was forbidden the priests because it involved the shedding of blood, which the church abhorred, and

it was relegated to the barbers. Hence we have the barber's pole, representing a white bandage entwined around a bloody limb. A class of barber-surgeons arose, characterized by ignorance and venality. Finally, as medicine gradually separated from the church, the medical profession redeemed surgery from the barbers, and in the course of time it became the most scientific branch of medical practice.

Physicians in early times dispensed their own medicines which were prepared for them by their apprentices. As knowledge advanced, chemistry displaced alchemy and the chemical investigation of materia medica products made pharmacy complex, and it was relegated to the apothecaries.

The ancient apothecary dispensed his herbs and ointments to an ignorant and credulous public. When the duty of serving the medical profession was relegated to the apothecaries, the vocation gradually separated into two classes, one class being educated in chemistry and professional in character, and the other class retaining its ancient character.

When the vocations commenced to organize into guilds, the apothecaries belonged to the guild of grocers. Physicians ranked higher socially than surgeons because of educational qualifications. The surgeons obtained their training from apprenticeship.

History teaches us that the confidence of the public in physicians and medicine was due in the first place to ignorance and credulity. This was replaced in time by reverence, owing to the higher conception of medical service. The service of the physician-priest was pre-eminently altruistic. No fees were charged for services rendered. The physicians were supported by the church, and the church in turn supported by the people as an act of worship. When medicine separated from the church and became a money-making vocation, it gradually declined in public esteem. The public has lost confidence in the physician just in proportion to their belief that the physician is animated by selfish rather than altruistic principles. As the medical profession now exists, it can be said with considerable truth that the public has lost confidence in medicine because it is no longer an altruistic profession, but a commercial business.

In this discussion, medicine must be considered under its several meanings as defined by the dictionary. Medicine is not only defined as the healing art, but also as a science of the preservation of health and of treating disease for the purpose of cure. Pre-

ventive medicine has every right to lay claim to altruism, and therefore the medical profession can still claim to be altruistic, in so far as it deals with the prevention of disease.

Where the medical profession has lost out is in that part of medicine which relates to the treating of disease. Therapeutic nihilism is prevalent throughout the medical profession of the world. The knowledge of the causes and nature of what we call disease has gradually increased, but the profession freely confesses its impotence to cure. The popularity of Christian Science, the Emanuel movement, faith cure and other cults which include religion and medicine is not surprising. These cults give the people what they want, namely, a medical service in which reverence, respect, awe and affection, and worshipful regard are blended. The service rendered by the old family doctor described in Watson's "Bonnie Briar Bush" was of a character that called forth such feelings of regard. We find in the Hippocratic Oath and in the Oath and Prayer of Maimonides a recognition of the same altruistic principles of service.

The dictionary gives another meaning to medicine, namely, a substance reputed to possess curative or remedial properties. From the very earliest times, the people have had a most abiding faith in the healing power of medicines themselves, irrespective of the physician or the apothecary. Faith in drugs, druggists and doctors has been terribly shattered by the revelations which have resulted in the passage and enforcement of the pure food and drug laws by the national and state governments. The fact that such laws are necessary has come as a shock to the people. This feeling of distrust has been largely increased by the attacks of the *Ladies' Home Journal, Collier's Weekly* and other popular magazines.

While it is true that the credulity of the public in relation to the value of drugs as remedial agents has departed never to return, yet the medical profession is not ready to accept as true the saying that "mankind has been drugged to death, and the world would be better off if the contents of every apothecary shop were emptied into the sea."

Another potent factor in destroying the confidence of the public in drugs is the misleading system of advertising of drugs in vogue at the present time. During the past thirty years, tens of thousands of alleged new remedies have been introduced by advertising, and not more than one-tenth of one per cent. of them

have proved of any therapeutic value whatever. This objectionable system of advertising has not been confined to the so-called patent medicine business by any means. The medical press and the manufacturers advertising their products to the profession are equally culpable. Introducers of alleged new remedies posing as medical scientists and using the medical societies and press for self-advertising are equally to blame. This condition of affairs could never have occurred if the professions of medicine and pharmacy as custodians of the materia medica had been true to their obligations toward the public. This system of advertising is protected in a large measure by the patent and trademark laws, which, as now administered, have created lasting monopolies in materia medica products. The object of the patent law is not to create monopolies except in so far as such monopolies permit progress in science and useful arts. No person acquainted with the manner in which our patent laws are now administered would have the temerity to claim that progress in the science of medicine and in the useful parts of pharmacy and drug therapeutics is being promoted. The object of the trademark law is to protect the public from the fraudulent substitution of one brand of goods for another. We all know that this object is not being accomplished, and that, on the contrary, a system of lasting monopoly is being built up under the protection of the trademark law.

Want of integrity on the part of certain pharmacists guilty of fraudulent substitution is another potent cause of loss of public confidence. This condition especially maintains in our great cities where the practice is alarmingly prevalent. It seems to be largely confined to the poor sections, although existing in other sections also. Fortunately, the condition thus far is the exception rather than the rule, but the evil seems to be extending. Those who are guilty are throwing discredit on the entire fraternity and laws ought to be passed making fraudulent substitution a crime punishable by fine and imprisonment.

It would be of immense advantage to both professions and to the public at large if confidence in the materia medica could be restored—not that confidence founded upon credulity but resulting from the co-operative investigation of the materia medica and the proper standardization of all substances used in the treatment of disease.

Drug standardization consists of fixing a nomenclature for medicinal drugs, chemicals and pharmaceutical preparations; it consists

in adjusting finished products to fixed standards and in devising means for keeping them there for a sufficient length of time to permit their proper application as therapeutic agents; it consists in reducing this knowledge to law and embodying it in system, and then teaching it in medical and pharmaceutical colleges, universities and journals; it consists in legislation limiting the practice of pharmacy to pharmacists and therapeutics to physicians, and forcing them to conduct their respective vocations in a professional manner.

There are before Congress a number of bills intended by their authors to limit the practice of medicine and pharmacy to persons who are qualified by education and license. It is hoped that by this means much can be done in the way of restoring the confidence of the people in drugs as remedial agents. It is believed that one good reason why the public has lost confidence in drugs is due to the fact that they have not been properly used as medicines owing to lack of teaching of materia medica and drug therapeutics in the medical colleges and also to the want of knowledge on the part of people who medicate themselves, and also to the ignorance of drug therapeutics on the part of those who are in the drug business, especially those who are advertising medicines to cure the sick or recommending them over the counter to the self-medicating public.

The principles underlying proper medical and pharmacal laws were laid down by the Supreme Court of the United States in the case of Worden *vs.* California Fig Syrup Co., No. 35, October term, 1902, as follows:

> "Most, if not all, the States of this Union have enactments forbidding and making penal the practice of medicine by persons who have not gone through a course of appropriate study and obtained a license from a board of examiners; and there is similar legislation in respect to pharmacists. And it would seem to be inconsistent and to defeat such salutary laws, if medical preparations, often and usually containing powerful and poisonous drugs, are permitted to be widely advertised and sold to all who are willing to purchase. Laws might properly be passed limiting and controlling such traffic by restraining retail dealers from selling such medicinal preparations, except when prescribed by regular medical practitioners."

The bills before Congress referred to are in the main in harmony with the Supreme Court's position on this subject, but they all need amending before being enacted into law.

I do not take it that the Supreme Court intends to exclude the proper use of simple remedies for domestic practice. The objection to the use of drugs for self medication is not only due to

the fact that skill is required in the employment of drugs, but especial knowledge is necessary for diagnosis. A person with abdominal pain may be suffering from a simple colic or an appendicitis. It is therefore important that the people should be taught how to use simple remedies for proper self medication, and the medical and pharmaceutical professions should co-operate to that end.

Now if the medical and pharmaceutical professions and the manufacturers engaged in the pharmacal and chemical arts would unite and co-operate for the purpose of securing proper legislation relative to the practice of medicine and pharmacy, we would probably secure legislation of the greatest value to all concerned. Drugs are not commodities like dry goods and groceries. The drug business has no excuse for existence except to the extent that drugs can be employed for the medication and cure of disease. The questions involved are those of life and death. Misleading statements regarding the therapeutic properties of drugs can only have one effect in the long run, and that is to destroy the confidence of the persons who are misled by reading them.

It is time for all concerned to consider the question of medical and pharmacal service in the light of history. As Dr. Beates very clearly pointed out, medical practice is seriously declining and the public is losing confidence in the physician and in drugs. This not only applies to America, but to other countries as well, and especially so to countries where medicines are freely advertised for sale to all who are willing to buy.

This loss of confidence is liable to be followed by very drastic legislation, emanating from the public itself, unless those engaged in the practice of medicine and pharmacy and in the materia medica supply business give the public the kind of service required to restore public confidence.

CORRESPONDENCE.

American Medical Association.

Council on Pharmacy and Chemistry.

To Manufacturers of and Dealers in Medicinal Products:

Gentlemen:—The Council on Pharmacy and Chemistry of the American Medical Association, since its organization, has been obliged to refuse recognition to a number of otherwise unobjection-

able preparations, because their names were considered detrimental to the best interests of the public and the medical profession. In the hope that in the future those who introduce new remedies may see their way clear to adopt names which will not be open to objection, the Council has decided to issue this explanatory statement to the manufacturers of medicinal substances.

The trade names of pharmaceutical preparations or mixtures should be so framed as to indicate the most potent ingredients. An article whose name gives a false impression in regard to its identity or origin or which is in other ways misleading would not be acceptable for New and Nonofficial Remedies. An article will not be acceptable if its name suggests to the laity the diseases or conditions in which it is said to be indicated.

After December 31, 1912, recognition will be refused also to names so framed as to indicate even to physicians the diseases or conditions for which the article is to be used. The Council will make no objection to articles submitted to it before December 31, 1912, on the ground that the name is suggestive to the physician, provided that the name is already in use at the time of submission and also provided that the name is so framed as not to be liable, in the judgment of the Council, to lead to self-medication on the part of the public.

Medicine, in common with other branches of knowledge, requires that the subjects with which it deals be provided with a rational, descriptive nomenclature. The Council holds it desirable and important not only that the medicaments official in the pharmacopœias should be provided with scientific names, but that those of a proprietary character should also have names which are descriptive of their composition. Further, the Council believes that the interests of both the manufacturer and the consumer, the physician and his patient, can be sufficiently safeguarded if to the descriptive name of an article there be appended a distinctive word, syllable, initial or sign that shall identify its manufacturer. In substantiation of this it may be stated that such designations have permitted manufacturers to build up almost world-wide reputations for their products. Reference need only be made to chloral hydrate, Schering; chloroform, Squibb; phenacetin, Bayer; quinin sulphate, P.W.R.; sodium salicylate, Merck, etc. In view of these considerations, the Council offers its endorsement and coöperation to any effective movement toward the establishment of a rational, and if possible, international system of the naming of medicaments.

However, the Council recognizes that trade conditions make difficult or infeasible, at this time, the adoption of such a rational system of nomenclature. But, on the other hand, experience has shown it possible to give names to new remedies which at least shall indicate their principal constituents. Thus among the articles described in "New and Nonofficial

Remedies" appear such names as arsenoferratin, an organic compound of iron and arsenic; Bornyval, a valeric acid ester of borneol; brovalol, a bornyl bromvalerate; carbosant, a carbonate of santalol; guaiacodein, a compound of codein and guaiacal; tannismuth, a tannate of bismuth. Therefore the Council recommends that all remedies be given names which shall at least be suggestive of their most characteristic or potent constituents. The Council gives the fullest recognition to the principle that a discoverer has the right to name his discovery and interposes no restriction in the naming of new substances, provided that such names shall not be detrimental to the progress of medicine and thereby work against the welfare and health of the people.

Names which are suggestive of the diseases or conditions in which the remedy is said to be indicated are objectionable because the layman becomes familiar with the names of such remedies and their uses through physicians' prescriptions and is thus led to use them in indiscriminate and harmful self-medication. The many cases of harmful self-medication with such remedies as migrainin, diabetin, purgen, antikamnia, antitussin, which preparations at first were exploited to medical men only, are sufficient to show that such names should be forbidden.

But even if the name of remedy does not disclose its proposed use to the laity, it is still objectionable if it suggests to the medical man the diseases or conditions in which the remedy is to be used. This for the reason that the thoughtless physician will base his use of the remedy on the name without giving due consideration to the condition and symptoms of the patient.

Recognizing that some therapeutically suggestive names have been applied without any intention of appealing to the laity thereby, and further recognizing the difficulty of changing a name once established, the Council has decided to make no objection to names that are now in use if they are therapeutically suggestive to physicians only. Such articles, if on the market and submitted prior to December 31, 1912, will be considered acceptable in so far as their names are concerned.

The following rules apply to the names of articles proposed for inclusion with New and Nonofficial Remedies:

1. The names of pharmaceutical preparations or mixtures must indicate the most potent ingredients.

2. Names which are in any way misleading will not be accepted.

3. Names which suggest diseases, pathologic conditions, or therapeutic conditions will not be admitted, except as provided under 4.

4. An exception is made for established names of synthetic substances, active principles, and other new substances: For these if submitted prior to December 31, 1912, therapeutically suggestive names may be admitted, provided that the name has been in

actual use prior to December 31, 1912, and provided further, that the name is not likely to foster self-medication by the laity.

W. A. PUCKNER, *Secretary.*

535 Dearborn Ave.
CHICAGO.

REPORT ON MARKET CONDITIONS FOR MESSINA ESSENCES DURING THE FALL AND WINTER SEASONS 1911–1912.

We beg to submit herewith the usual Market Report of our parent house, Messrs. Schimmel & Co., for the information of our patrons with reference to the prevailing market conditions for the Messina Essences during the past season:

"Referring in detail to the different Messina Essences we find the following conditions:

Oil of Bergamot: We left this Oil in September of last year at an average market price of M. 42.— to M. 43.—per kilo. This price prevailed all through September and October, during which time the still existing stocks of oil were practically consumed to the last drop.

During the last four to six weeks before the arrival of the new oil the stocks were depleted to such an extent that some of the obstinate holders, who had refused to sell before, could realize for their oil prices up to M. 50.— and M. 52.— per kilo.

Though the conditions of the new crop did not appear very promising at all, the producers expected, nevertheless, that prices of M. 40.—to M. 41.— would yield a sufficient profit and, therefore, began around the middle of October to enter into the first transactions for future delivery of the new oil at these prices.

As soon as a price for the new oil was established, a big French concern entered the field and began to buy up all the new crop oil that was offered for future delivery and continued buying even at advancing prices until they had secured an amount of about 15,000 kilos.

The prices, which at the beginning of these operations ruled at about M. 41.—, were in this way driven up to M. 46.—per kilo, which quotation prevailed when the first lots of new crop oil appeared in reality on the market.

The ester content of Bergamot Oil depends, as is well known, upon the degree of ripeness of the fruit. Unripe fruits furnish an oil which contains between 28 and 32 per cent. of Linalylace-

tate; riper and completely ripened out fruits give oils whose ester content rises as high as 42 and even 44 per cent.

As the value of Bergamot Oil is measured by its ester content, it was in former years in the interest of the producers to have their fruit well ripened before pressing the oil. But the fact that no old oil was available in this season to bridge over the interim and the urgent demand of the buying element in the market induced the producers during this season to depart from this principle and fruit in more or less unripe condition was used for the hasty production of oil, the more so, as experience had taught the producers that such fruit, though yielding an oil of lower ester content, furnishes a larger amount of oil than fully ripe fruit.

If in former years, under more normal conditions, oils with a higher ester content enjoyed, as a matter of course, the preference over the poorer oils, there were during the season with its strained conditions plenty of buyers that were eager to take up even these deficient oils.

In consequence of this, there developed quite a lively market for Bergamot Oil in December of last year which brought about large transactions at prices of from M. 43.— to M. 48.— per kilo, and everything seemed to point to a further regular development of conditions until in the first days of January, 1912, a catastrophe happened which overthrew all previous estimations and anticipations instantly.

Cyclones of a violent character visited the coasts of Calabria on the 3rd and 4th of January to return again with unbroken force on the 6th and 7th of the same month. Through the vehemence of the storm practically all the fruits still hanging on the trees were beaten down and thousands of trees knocked down or rooted out. Only a few well-protected valleys escaped destruction by the enraged elements.

As is well known, the manufacture of Oil of Bergamot is a rather difficult and tedious process, which requires the use of special machinery. The enormous quantity of beaten off fruit covering the ground prevented, therefore, the utilization of a very considerable part of it in the short time which elapsed between their falling from the trees and the decay of the bruised fruit. This calamity was aggravated by the great difficulty to procure adequate manual help in these districts which are from year to year more and more depleted in population through the constant emigration

to America. In this way many thousands of fruits were entirely lost for the production of oil and the yield from the more or less damaged fruits showed, besides, such a deficiency that not more than about one-half of the regular quantity of oil was obtained from them.

These storms had produced such a tremendous devastation in the fertile districts of Southern Italy that many of the fruit growers were nearly ruined and an enormous financial loss caused by this catastrophe. Another grave consequence of the storm was that whatever fruit was left hanging on the trees did not fully ripen any more, as it was evidently crippled somewhat, while the beaten off Bergamot fruit furnished only a very poor grade of oil. Under these conditions nearly one-half of the total crop had to be worked off in the month of January under the most adverse conditions, so that the loss in oil can be pretty accurately estimated at 30 to 40 per cent. of the amount previously counted upon.

It is evident that in this way the production was brought to an abrupt end, and the result of all these conditions may be summed up in stating that the entire crop did not amount to more than about 40 to 45 per cent. of an otherwise medium crop, and that the oil showed almost invariably a very low ester content.

High-grade oils of 37 to 38 per cent. ester have been produced only in very small quantities and are hard to obtain.

That the market, under these abnormal conditions, showed extraordinary fluctuations is only natural. The oil producers who did not obtain more than one-half of the quantity of oil, they had counted upon, and who, besides, had only oils at their disposal of a much lower degree than they had sold beforehand, found themselves in a two-fold calamity and many of them could simply not fulfill their obligations. The exporters in turn, who could not rely upon the deliveries of oil from the producers to cover their own sales for future delivery, had to enter the open market and buy whatever they could obtain to protect their own *découvert*. That this situation had to lead to a wild speculation and manipulation of the market is self-evident and the prices advanced in the course of a few weeks from a level of about M. 45. to M. 65. per kilo, much to the detriment of the export trade. It is no wonder that the producers tried to fructify this condition as much as possible and held to the high prices tenaciously in order to recover whatever they could from the losses they had previously sustained.

On the other hand, the consuming trade will naturally shrink from those exorbitant prices and incline more and more to the synthetic oils which are offered as substitutes for the natural oil.

During the last weeks the prices for the oil have slightly yielded as some of the producers have to realize upon their holdings, so that an average quotation to-day may be recorded at M. 50.— to M. 63.—, according to the ester content of the oil.

It may be mentioned here once more that the oil which was produced under such adverse and abnormal conditions shows, with few exceptions, a considerable deficiency in quality compared with oils from former crops. The odor is generally just as satisfactory as the ester content; the rotation, the specific gravity, all show anomalies. As nearly all of this year's oils are derived from more or less unripe fruit, we find aside from the deficient high angle of an abnormally low specific gravity an exceedingly high angle of rotation, which has been found in single oils to be as high as 22 to 23°.

Sweet Orange Oil: The new crop found the market entirely bare of old stocks and the arrival of the new oil was, therefore, the signal for quite a lively business which was further animated by the realization that the crop was only of small dimensions. The tendency was firm and upward from the start on and prices kept on M. 17.— to M. 18.— per kilo until, later on, some stocks had again accumulated. Then the market yielded slightly, which induced those familiar with the conditions in the producing districts to follow the receding market with their purchases until this reached the low-water mark around Christmas of last year. Since then the tendency has been slowly upward again until the price settled on about M. 18.— per kilo, as before.

The supplies of Sweet Orange Oil are pretty scarce, so that we will have, in all probability, to count with higher prices for the coming summer months.

Bitter Orange Oil: The prices of oil of last year's crop were about on a level with those of the oil of sweet oranges. Larger stocks could not be accumulated, and it is, therefore, very likely that higher prices will rule with the advancing season. All indications, by the way, point to the fact that the interest in this oil is gradually decreasing.

Oil of Mandarins: The new crop was not a bad one and can safely be compared with a good average crop. If, nevertheless,

the price settled from the start on M. 43.— per kilo, a price which has been kept up nearly unchanged, this was due to the fact that neither in Italy nor abroad existed any stocks of old oil at all, so that the new oil found and is still finding a ready market all over.

Oil of Lemon: This important article has undergone several very considerable price fluctuations, during the last seven months. The last crop, as is well known, was barely of medium size, but for the reason that there were considerable stocks carried over from the previous season, there were at all times sufficient supplies to provide for the exigencies of the export trade.

These conditions developed a depressed market during the fall months of last year which affected the prices of oil for prompt as well as for future delivery. The exporters made strenuous efforts to induce their foreign correspondents to close contracts for future deliveries at constantly receding prices and the local holders tried to dispose of their prompt stocks likewise. The natural consequence was that from the beginning of September towards the end of October the prices for prompt oil gave way from M. 15.— to M. 12.— per kilo and for goods on future delivery from M. 11.— to M. 10.25. These developments in the original market made the foreign buyers rather reserved and cautious in their transactions, and it was not until it was generally realized that the exportations for the new crop had been quite considerably estimated that this downward movement came to a standstill. This caused quite a sharp reaction of the market and in a few days the price for future deliveries had again risen to M. 10.75 to M. 11.— per kilo, while for prompt oil M. 12.25 to M. 12.50 was paid.

Now, when the first actual delivery period approached in December of last year, the fact was disclosed that there existed quite a large uncovered short interest and that the actual amount of oil ready for delivery was entirely inadequate to compensate for the obligations entered into during the period of depression.

If in the preceding season of 1910–11 an amount of about 100,000 kilos of old crop oil was at the disposal of the export trade, all the available stocks of old oil obtainable in the season of 1911–12 did not amount to more than utmost 30,000 kilos, and this deficiency drove the prices up in the first half of January, 1912, to M. 11.50 per kilo.

In the first days of the second half of January the East and

North Coasts of Sicily were visited by heavy storms, which caused the trees to shed an enormous amount of fruit and otherwise damaged the fruit trees. The amount of fruits, so knocked down from the trees, was so large that most of them had to be used only for the manufacture of Citrate of Lime in order not to lose them entirely. This furnished another sharp impetus for an upward movement of the market, which advanced by leaps and bounds to M. 12.50 in the beginning of February, to rise in the first two weeks of February to M. 14.25, and to reach the high-mark of this season with M. 14.85 during the first days of March.

Lemon Oil had now settled again at the same level which it occupied in September of last year, and the upward movement would have, no doubt, continued, if the depressing influence of the big strikes in several centres of the world had not also affected the market for Messina Essences. So, following the general tendency of trade in the international markets, its upward course was halted and a slightly easier tendency has fixed the price at present on an average of M. 14.25 per kilo.

To arrive at certain conclusions in reference to the further development of the market for Lemon Oil is this year connected with exceptional difficulties.

According to statistical figures, the entire amount of Lemon Oil at the disposal of the world's consumption is this year by no means larger than last year. It must further be taken into consideration that the world's consumption last year did not only absorb the entire amount of last year's crop, but in addition an amount of about 70,000 kilos carried over from the preceding season.

The exportations during the last three months show an increase of 50,000 kilos over the figures for the corresponding period of last year. This shows that the 30,000 kilos of old oil left over from last season must have been consumed for these shipments together with the new oil, as the latter would not have been sufficient to make up the required amount. It has so far been impossible to accumulate any stocks of new oil in the shipping ports, and this after three-quarters of the new manufacturing season have elapsed! Besides this, all the producers and some of the export houses are in arrears with their deliveries.

In the district of Palermo the new crop has been more disappointing than in the other parts of Sicily, and the production

of oil has practically not been started here at all. It seems that the growers in this district are satisfied to ship their fruit for the daily consumption of the larger Italian cities, which relieves them of all further trouble and yields evidently sufficient profit to prevent them from using the fruit for the production of oil.

A considerable reduction in the prices of the oil could only be caused by the accumulation of stocks in the hands of the producers, which according to the prevailing conditions appears very unlikely not only for the present, but also for the rest of the producing season. The foreign markets, on the other hand, do not seem to be fully covered for their yearly consumption, and it seems, therefore, that only a great war or similar factors could produce a depression of the market. As we hope that no international complications will interfere with the world's trade in the near future, we do not see any actual cause for a weaker market, while a strengthening of the tendency might be produced at any moment through a general improvement of the trade conditions in the international markets.

The present situation in the producing districts is such that it is near to impossible to make any predictions for the new crop. The southern parts of Italy have had a very mild winter with little rain and very little snow in the mountainous regions. These favorable weather conditions have produced an abundant foliage on all the various citrus trees, with the exception of Bergamot, which would point to a satisfactory flowering period, if the scantiness of the rainfalls during the winter and the already apparent dryness of the deeper soil might not interfere with the further sound development of the trees. Only the climatic conditions during the coming spring months will definitely show whether the hopes for a good crop will be realized, or the apprehensions for a dry summer and a scanty crop in consequence of it will be justified.

Another factor which might greatly influence the development of the new crop, and which deserves mentioning here, is the occurrence of a certain species of plant lice (Aphidae), the so-called Blood Louse, which during the last two years has affected extended districts, especially in the vicinity of the larger cities in Sicily and Calabria.

This parasite attacks the trees and slowly destroys the same. Especially prone to these attacks are the Mandarin, Bergamot

and Lemon trees, while the sweet and bitter Orange trees seem to possess a greater power of resistance against this infection. Systematic experiments made by the Governmental Agricultural Institutions have resulted in the finding of certain methods for the destruction of these parasites, but their application, which consists in frequent sprinkling of the trees with antiseptic solutions, is not only difficult, but also increases the expenses for the cultivation of the trees considerably and does not vouchsafe the restoration to health of the affected trees. This new disease of the Citrus trees is a great danger for the entire Agrumen industry, and is likely to interfere heavily with the future production of Messina Essences in Sicily and Calabria.

"Let us hope that science will soon find the right weapons to fight off this new plague to save us from a new grave peril for our industry."

FRITZSCHE BROTHERS.

NEW YORK, April, 1912.

OBITUARY.

CLEMMONS PARRISH.

As an American institution the family of Parrish is much older than the State of Pennsylvania itself. Settling first in Maryland, they came to Philadelphia almost with its founding, and have been actively identified, professionally and philanthropically, with its growth, ever since. Among the early members of the family, noted as physicians, educators, and philanthropists, one name stands out pre-eminently, Professor Edward Parrish. He was prominently connected with the Philadelphia College of Pharmacy as trustee, and later as Professor of Materia Medica and of practical pharmacy; he was a noted chemist and pharmacist, celebrated throughout the United States; he was a member of many pharmaceutical organizations; and contributed largely to the literature of pharmacy and medicine.

The second son of Professor Edward Parrish, Clemmons Parrish, was born August 1st, 1848. His early education was obtained in Friends' School, and he early showed a preference for scientific studies, giving promise of perpetuating his father's memory as a pharmacist. At the age of seventeen he graduated from the Phila-

delphia College of Pharmacy, and in 1869 joined the College, and was actively identified with the Alumni Association. He was engaged in the practice of his profession with his father, under the trade name of Edward Parrish and Son, at 8th and Arch Sts., which store was well known, and from which many of the great names in Pharmacy of to-day, received their first practical experience. Professor Parrish died in September, 1872, and shortly after that the store changed hands and Clemmons Parrish became identified with the manufacture of a sparkling drink, Zoedone, and moved with his family to Orange, New Jersey, and later to New York. In 1881 he purchased a drug store in Brooklyn, situated at Henry and Orange Sts., and practiced pharmacy there until his retirement from business in 1906. Mr. Parrish was of a retiring nature, and never associated himself prominently in a public way, but his business grew and he became well known for the quality and care with which he compounded prescriptions, and manufactured specialties and pharmaceuticals, so that physicians recommended their patients to him, and his trade included the most prominent families in the city. He always attended to his duties personally, and could be found in his store at any hour of the day. He had many clerks who have profited by his teachings, and he also prepared many young men in practical pharmacy who are prominent as druggists and manufacturers, and acknowledge their indebtedness to him for early training. He was of the old school of druggists, and never could adapt himself to the newer methods of business. Drugs and pharmaceuticals could always be found in his store, and those sundries required in sickness, but he was loath to add the hundred and one accessories to be found in the modern pharmacy, and filled his shelves with specialties of his own manufacture, and with preparations of a proprietary character as they might be demanded by physicians.

He was very charitably inclined, and would never refuse a request to help the sick. His advice was sought very often during the day, and the poor of his neighborhood looked upon him as their best friend. The store at Henry and Orange Sts. became a landmark in the city, and still bears the name of "The Parrish Pharmacy." The success of the business in that locality will always depend largely upon the name of Parrish.

After Mr. Parrish's retirement, he lived with his son, Dr. Edward Parrish, for several years, and two years ago removed to

Philadelphia again, to the city of his birth, to pass his remaining years. On March 28th he was stricken with pneumonia, from which he died three days later in the Garrettson Hospital, at the age of 63 years and 7 months. He leaves a widow, Emma Powell Parrish, residing at 1704 Race St., and two sons, Edward Parrish, a physician in Brooklyn, N. Y., and Henry C. Parrish, a clerk in the firm of C. C. Miller & Co., of Philadelphia, and residing at Riverton, N. J.

Mr. Parrish was a member of the Religious Society of Friends, a kindly, gentle, upright man, of sterling integrity, and worth, mourned by all who knew him, and valued as a sincere friend. His interment was in Friends' Cemetery, in Prospect Park, Brooklyn.

BROOKLYN, N. Y. EDWARD PARRISH, M.D.

PHILADELPHIA COLLEGE OF PHARMACY.

ANNUAL MEETING.

The annual meeting of the College was held March 25th, 1912, at 4 P.M., in the Library, the President, Howard B. French, in the Chair. Twenty members were present. The minutes of the quarterly meeting held December 26th, 1911, were read and approved. The Minutes of the Board of Trustees for the meetings held December 5th, 1911, January 2d, and February 6th, 1912, were read by the Registrar, J. S. Beetem and approved.

President's Address: President French read his Annual Report which was ordered entered on the minutes. The following items of information are abstracted from the Report:

Material repairs and improvements were made to the heating and lighting plant, and they have shown more than the usual satisfactory results during the strain which was placed upon them owing to the extremely severe winter weather: during a portion of the time it was necessary to run the heating plant all night to keep the buildings comfortable when the temperature was hovering around zero.

The Chemical Laboratory was repainted. The Chemical Lecture Room had some repairs made to the ceiling, and the ceiling and walls repainted. The Reading Room was thoroughly overhauled and repainted as were also the vestibules, hall, and corridor. The seats in the lecture rooms have had placed upon them black and white enameled iron numbers, the better to register the attendance

of the students at the lectures, in pursuance of the plan of the Pharmacy Board. Reflex gas burners were placed in vestibules, hall landings and library and besides their utility have relieved the dynamos of the extra load they were compelled to carry before these lights were put in.

The Gymnasium was established last year in the expectation that it would prove of material advantage to the students attending the College, but lack of care and reckless use of it by the students has caused considerable annoyance to those in charge, and would urge, that in future the Gymnasium be not opened unless someone in authority is in charge to maintain supervision of the room. A portion of the basement formerly used as a gymnasium has been partitioned off and twenty-five steel lockers placed therein for the use of the students. This seems ample for the present requirements of the class. The College property as a whole is in a fairly good condition, but in the near future it will be necessary to do painting on the exterior of the building.

There is a total attendance of 489 students, including those students taking special courses in the various departments. It will be of interest to note that all graduates from the special courses in chemistry have had no difficulty in securing lucrative positions —in fact more requests are made for these men than can be supplied by the College, and there is constantly on file a list of applications for them.

During the year a new electrical slide and opaque projection lantern, the gift of William E. Weiss, of Wheeling, West Virginia, a member of the class of 1896, was installed in the Chemical Lecture Room and has proven of material benefit.

In the Department of Materia Medica the increasing importance of treating diseases by means of serums, bacterial vaccines, etc., has been recognized and increased attention has been given to the subject. The physiological assay of drugs has also been brought prominently to the attention of the third year class, and for the first time in the history of the College the subject has been demonstrated upon living animals. The requirements of the Conference of Pharmaceutical faculties that six hundred hours should be devoted to laboratory work has led to important extensions in the work of the Department of Operative Pharmacy.

It is interesting to know that during the past summer a Professor of Pharmacognosy in one of the Western Universities spent

much time in studying the methods and technic in use in the College. The greenhouse and roof garden has been used to a greater extent for experimental purposes than ever before. The Professor in charge hopes in the near future to suggest the establishment of a special course in plant physiology. During the past year a number of native medicinal plants were sent to Professor J. W. Moll, of Gronigen, Holland, who, in acknowledgment of this courtesy, has sent a number of lantern slides, which will be of use in demonstrating the lectures.

The course in Commercial Training is being developed with very satisfactory results, attendance is good and the interest unabated. Lectures by business men, mostly graduates of the College, of an hour's duration, have added value to the course. This course is unique in Colleges of Pharmacy, and this College was the first to take up this subject, and examinations held which have an equal rating with the other branches.

The act creating a Bureau of Professional Education became effective July, 1911. The law requires that all first year students must have entrance qualifications equal to at least one year high school instruction.

During the year one member has been elected, one resigned, and three have died, namely, Thomas M. Newbold, April 2d, 1911. Joined the College in 1872. Wallace Procter, May 27th, 1911. Joined the College in 1874. George R. Vernon, September 16th, 1911. Joined the College in 1872. In the death of Wallace Procter the College lost a most active member. For many years he served on the Board of Trustees.

During the past year a very active effort was made to secure ground upon the Parkway for the use of the College in erecting new buildings suitable for the growing needs of the institution. The ordinances necessary for this purpose passed both Select and Common Councils and were approved before Mayor Reyburn went out of office. The necessary petition required to further this object was filed in the Court of Quarter Sessions, but other obstacles have arisen and the matter is resting in abeyance. Your President, however, feels that with the great good your institution is doing, and its liberality towards the educational resources of the city in giving to the Board of Education six scholarships each year, or having in course eighteen scholarships per year, some recognition must necessarily be given by the city authorities to the College.

In closing, your President has pleasure in acknowledging the honor which was extended to him by the Alumni in presenting to the College on April 4th, 1911, a large oil portrait of himself, painted by Hugh H. Breckenridge, one of the most prominent artists of the city. He also expresses his appreciation of the active co-operation of his fellow officers and the faculty during the past year.

Committee on Nominations: The report of the Committee on Nominations was read, and ordered entered and filed.

Report of Committee on Pharmaceutical Meetings: The meetings have been held regularly and were presided over by different members of the College. Papers or addresses were presented by C. B. Lowe, George M. Beringer, M. D. Allen, C. Mahlon Kline, Otto Raubenheimer, H. M. Seckler, M. Becker, J. Percy Remington, E. F. Cook, E. H. Sparks, A. W. Miller and John K. Thum. The general discussions were participated in by very many of the members. Specimens and apparatus were presented by Dr. W. H. Nagai of Japan, President French, Parke, Davis and Co., Professor Sadtler, J. W. England and Charles Emig.

With the change in the By-Laws, leaving the date open for the holding of the meetings, they have been held on either Mondays or Fridays, which seemed to suit the convenience of the students. They have been quite well attended, and in a few instances largely so. The meeting devoted to Sunday closing and shorter hours was particularly well attended, and a number of the students participated in the discussion. In planning for the meetings next year a Recorder will be selected who will give special attention to the meetings and arrange the details of the program.

Committee of Publication: The AMERICAN JOURNAL OF PHARMACY has been published regularly during the past twelve months. The financial statement shows that the receipts for the past year were larger than the previous year but the cost of printing and electrotyping were higher. The May, 1911, number was devoted largely to college matters of both general and special interest, making it necessary to print an unusually large number for that month. A number of analytical and scientific papers were also published which were expensive in composition. The usual appropriation to cover the cost of JOURNALS furnished to members and exchanges was made.

Editor's Report: During the past year there have been published 579 pages, exclusive of index, making an average of 48½ pages to an issue. This matter included 62 original and selected papers, viz.: 8 on chemical subjects, 13 on assaying, 10 on pharmaceutical subjects, 6 on pharmacopœia, 4 pharmacognostical investigations, 5 biological standardization, 2 technical subjects, 3 legislative and educational, 3 biographical, and 3 miscellaneous. Also the quarterly review on Progress in Pharmacy and 37 book reviews, Reports of the Meetings of the College, Board of Trustees, the various National and State Pharmaceutical Associations, collateral organizations, special lectures, personal and obituary notices, abstracts and miscellaneous items have also been fully reported. Attention may be called to some of the special features of the volume for the year just ended: The Quarterly Review of the Progress of Pharmacy, by Mr. Wilbert, is very helpful to pharmacists in keeping them posted as to the general trend of pharmaceutical activity, but also in keeping them informed on the properties of medicinal substances, as also on the newer views regarding the properties of well known substances. Dr. Frederick B. Power and his associates, of the Wellcome Chemical Research Laboratories, continue to send papers giving the results of their investigations. Several papers have been furnished by the workers in the Public Health and Marine Hospital Service. Dr. Taylor contributed an interesting paper on European requirements to enter pharmacy, to be followed by other papers on pharmaceutical education. The second paper by Mr. Reinick on insects destructive to books has been widely reprinted and abstracted. The paper by George M. Beringer, Jr., on the Extemporaneous Preparation of Medicated Gauzes has been of considerable interest to the pharmacist, as also the paper on Petrox Preparations.

That the AMERICAN JOURNAL OF PHARMACY is a veritable mine of pharmaceutical knowledge will impress itself on any one who takes the pains to examine its eighty-three volumes. And one is surprised no less at the quality than at the variety of the articles presented, one sees that this vast storehouse of information is not a sudden growth, but rather the result of slow and painstaking effort of most of the best minds that have contributed to the advancement of pharmacy. A pharmaceutical calendar from the pages of the JOURNAL could easily be made for the use of our members for the 365 days in the year. In connection with the

papers and discussions which we have had this year on the subject of "Sunday Closing and Shorter Hours," read at one of our pharmaceutical meetings, it is rather interesting to note that already in 1860 (Vol. 32, pages 473, 491 and 574) the Apothecaries of Philadelphia met at this College and practically settled the whole question of Sunday closing. This probably shows how in the evolution of any specific subject we as individuals seem to move in a circle. Every great fundamental subject relating to pharmacy we will find has been considered at some time in the pages of the JOURNAL, nearly every so-called "live subject" will be found to have been treated in its pages as "Apprentices and Early Training," "Relations of Physicians to Pharmacists," "Pharmacists as Analysts and Food inspectors," "Sterilizing Hypodermic Solutions," "Influence of Cultivation and Soil on Plants," etc. It will surprise some of our members to know that our predecessors devoted careful attention to the same problems that confront us, and solved them in much the same way that we are doing to-day. It emphasizes the fact that it is not so much a lack of knowledge of how to do things that is at the bottom of our difficulties, but in applying our knowledge in practice. This not only applies to the subjects enumerated but also with regard to our knowledge of drugs and preparations. A perusal of previous volumes will show that the task which we are trying to solve has been already thrashed out, and the experiences of others, if published, are well worthy of our consideration. That this is a point of view shared by others is shown by the increasing number of inquiries received for completing partial sets of the JOURNAL by individuals and educational institutions.

Curator's Report: The collections in the museum are growing in number and value. During the year some notable additions were made, among which were Chinese and Japanese drugs, photographs in colors of medicinal plants and historical donations. The great need of the museum is more shelf room for the display of specimens, this is especially true of the historical collection, which can be made of much popular interest, if properly displayed. Not only this, but a historical display in evidence suggests the donation of other historical objects.

The historical matter now on hand is large and most valuable and growing more so each year.

Librarian's Report: There have been added during the year by gift 101 volumes, by purchase 47 volumes. Up to this time

2872 books are ready for cataloguing; 40 volumes of periodicals and 5 volumes of theses were bound and 41 volumes of 1911 periodicals are ready for the bindery. The Government continues to send, Census, Treasury and Librarian Reports, Public Health, Commission of Labor Reports, and Bulletins and Circulars from the Department of Agriculture. American, English, and German journals are subscribed for. Other journals and periodicals are received in exchange. 829 persons consulted the library during the past year.

The President made the following appointments:

Delegates to the New Jersey Pharmaceutical Association: George M. Beringer, Henry Kraemer, C. B. Lowe, H. L. Stiles, H. P. Thorn.

Delegates to the Pennsylvania Pharmaceutical Association: C. B. Lowe, Joseph P. Remington, F. P. Stroup, William McIntyre, William E. Lee, E. M. Boring, Charles H. LaWall.

Committee on By-Laws: George M. Beringer, J. W. England, C. A. Weidemann.

Election of Officers, Trustees and Committees. The list of Nominees was read, when Mr. Rumsey moved, as there was no contest, that the secretary be directed to cast an affirmative ballot for the nominees, this being agreed to, the Secretary cast the ballot when the President announced the election of, President, Howard B. French; First Vice-president, Dr. Richard V. Mattison; Second Vice-president, Joseph L. Lemberger; Treasurer, Richard M. Shoemaker; Corresponding Secretary, Dr. A. W. Miller; Recording Secretary, Dr. C. A. Weidemann; Curator, Joseph W. England; Editor, Henry Kraemer; Librarian, Katharine E. Nagle.

Trustees for Three Years: Walter A. Rumsey, Jacob M. Baer, Warren H. Poley.

Committee on Publication: Samuel P. Sadtler, Henry Kraemer, Joseph W. England, Joseph P. Remington, Martin I. Wilbert, Miss Florence Yaple, Charles H. LaWall.

Committee on Pharmaceutical Meetings: Henry Kraemer, Joseph P. Remington, C. B. Lowe, William McIntyre, George B. Weidemann.

Professor Henry Kraemer moved that the members extend their felicitations to Professor Joseph P. Remington on his 65th birthday (March 26th) and the completion of 40 years as a member of the faculty, and stated that such a record was deserving

of our congratulations. Professor C. B. Lowe seconded the motion, which was adopted. The President announced the result to Professor Remington and expressed the hope of his continuance in the work of the College for many years to come. Professor Remington responded in a feeling manner and expressed the pleasure it gave him to receive these felicitations from his fellow members.

C. A. WEIDEMANN, M.D.,
Recording Secretary.

ABSTRACTS FROM THE MINUTES OF THE BOARD OF TRUSTEES.

December 5th, 1911.—Seventeen members were present.

Committee on Property reported that the electrical work necessary to install the lantern in the Chemical Lecture Room was completed.

Committee on Library reported a number of new books had been purchased; that the total number of books ready for cataloguing was 2088. A large number of persons used the Library during the month.

Committee on Instruction reported that the record of attendance of students at lectures is being kept in accordance with the new regulations, with satisfactory results.

The Board of Education appointed Mr. David Jackson examiner of pharmacy students.

A sub-committee was appointed to prepare an outline of studies equivalent to one year's attendance in a high school; same to be printed in pamphlet form and sent to prospective students.

Committee on Examination reported that Miss Asse Teisen had complied with all the requirements of the College and was entitled to receive the Certificate of Proficiency in Chemistry, and same was granted.

Committee on Announcement reported concerning the financial matters connected with the Bulletin. The expenses of the year were larger than the previous year, owing to the edition of over 40,000 copies of the May issue. The Bulletin goes regularly to over 3000 of the Alumni, by whom it is much appreciated. An Honorarium was voted to Prof. F. P. Stroup and George H. Benkert for valuable services connected with the Bulletin.

A communication was received from Joseph Huntington of the Class 1898, asking for a duplicate of the Robinson Gold medal, the original having been lost. The application will be granted upon the submission by affidavit of satisfactory proof of the loss.

January 2d, 1912.—Thirteen members were present.

Committee on Library reported that a number of books had been added by purchase, and that 2200 books were ready for cataloguing. A number of persons used the Library during the month.

Mr. England referred to the use of Alcohol by institutions, and read a communication from the Commissioner of Internal Revenue, also his reply. Mr. England stated that if the decision of the Commissioner is maintained, it would mean an increased cost to the College of several hundred dollars a year for Alcohol. The Dean stated that the abuse by some institutions of the privilege of obtaining tax-free Alcohol had led to the decision.

Committee on Examination presented the names of five candidates for the degree of Master in Pharmacy; action was deferred until the Special Committee to whom the names were submitted, made a report.

Committee on Announcement reported the issuing of the December Bulletin as the holiday number.

February 6th, 1912.—Seventeen members were present.

Committee on Library reported that some additions had been made by gift and purchase. An increased number of persons consulted the Library.

Mr. England read a communication from Internal Revenue Collector McCoach stating under what conditions the College could use tax-free Alcohol.

Mr. Osterlund reported having received from Mrs. William B. Thompson, a number of books for presentation to the College.

Committee on Property reported that the insurance agents advised some changes in present policies, which have made quite a saving.

Committee on Instruction. The sub-committee on preliminary education presented their report, also a report from the whole committee. Much detailed information was given, and the various recommendations were separately acted upon and agreed to, with the exception of one recommendation, action upon which was deferred for one month.

The Committee to whom was referred the names of the candidates for the honorary degree of Master in Pharmacy reported favorably, when a ballot was taken and they were unanimously elected. The degree will be conferred at the coming Commencement.